

CLAIMS

What is claimed is:

1. An occupant restraint assembly for a motor vehicle having an air bag system,
said assembly comprising;
5 a seat belt assembly having at least two sections lockable to each other;
a sensor assembly attached to at least one of said belt sections that operates to sense
tension on said belt;
a controller electrically connected to said sensor and the air bag system such that a
magnitude of tension on said belt above a predetermined magnitude indicates the
10 presence of a child restraint seat.
2. The assembly of claim 1, wherein the motor vehicle includes an air bag system,
and said controller communicates with said air bag system and disables deployment of
said air bag system upon the indication of the presence of the child restraint seat.
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3. The assembly of claim 1, wherein said sensor assembly includes a strain gauge
that operates to sense strain on said sensor and thereby tension on said belt.
4. The assembly of claim 1, wherein said sensor is attached in line with one of said
20 belt sections.
5. The assembly of claim 3 wherein said sensor includes a carrier having a tensile
section and said strain gauge is disposed within said tensile section.
- 25 6. The assembly of claim 5, wherein said carrier includes two belt loops disposed
on opposite ends of said tensile section, and said sensor is attached in line with one on
of said belt sections at said belt loops.

7. The assembly of claim 1, wherein said sensor includes three prongs extending from a common beam that can be attached to said belt sections without modification of said belt.

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8. The assembly of claim 7, wherein a middle prong is disposed between outside prongs and includes a strain gauge that operates to measure movement of said middle prong.

10 9. The assembly of claim 7, wherein, said belt is threaded through said prongs such that tension on said belt operates to force said middle prong in a direction transverse to the tension on said belt and tension on said belt is proportional to the movement of said middle prong such that tension forces on said belt can be determined.

15 10. The assembly of claim 1, wherein said sensor includes three prongs extending from a common beam and said belt is threaded over said outside prongs and under said middle prong such that tension on said belt will force movement of said middle prong in a direction transverse to said tension forces on said belt.

20 11. The assembly of claim 1, wherein said sensor is disposed in a housing having a cover.

12. The assembly of claim 11, wherein said housing is fabricated from plastic and said cover snaps onto said housing.

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13. An occupant restraint assembly for a motor vehicle having an air bag system, said assembly comprising;
- a belt assembly having at least two sections for locking engagement;
- 5 a sensor assembly having a tensile section and belt loop sections disposed on opposite sides of said tensile section, said sensor attached to said belt loop sections such that said sensor is in line with said belt;
- a strain gauge disposed on said tensile section that operates to sense strain on said sensor and thereby tension on said belt.
- 10 a controller electrically connected to said sensor and the air bag system such that a magnitude of tension on said belt above a predetermined magnitude operates to disable deployment of the air bag system.
14. A seat belt tension sensor assembly for a motor vehicle having a seat belt assembly and an air bag system, said assembly comprising;
- 15 at least three prongs extending from a common beam, said prongs attached to said seat belt without modification of the seat belt;
- a strain gauge disposed on one of said prongs to generate a force signal representative of a force exerted on the seat belt.
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15. The assembly of claim 14, wherein said force signal is received by a controller disposed within the motor vehicle, said controller signals the air bag system to disable deployment of the air bag system if the force signal exceeds a predetermined magnitude that indicates the presence of a child restraint seat.
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16. The assembly of claim 14, wherein said prongs are further defined as a middle prong disposed between outside prongs and said strain gauge is disposed on said middle prong to measure movement of said middle prong.

17. The assembly of claim 14, wherein the seat belt is threaded through said prongs such that tension on the seat belt operates to move said middle prong in a direction transverse to tension on the seat belt, movement of said middle prong being proportional to tension on the belt such that tension forces on the seat belt are measured.

18. The assembly of claim 14, wherein said prongs are further defined as a middle prong and outside prongs and the seat belt is threaded over said outside prongs and under said middle prong such that tension on the seat belt forces movement of said middle prong in a direction transverse to said tension forces on the seat belt.

19. The assembly of claim 14, wherein said sensor is disposed in a housing having a cover.

20. The assembly of claim 14, wherein said housing is fabricated from plastic and said cover snaps onto said housing.

21. A method of differentiating between the presence of a human occupant and a child restraint seat in a motor vehicle, said method comprising the steps of;
sensing tension exerted on a seat belt;
communicating the magnitude of the sensed tension to a controller;
comparing the magnitude of tension to a predetermined tension; and
determining that a child restraint seat is present if the sensed tension is greater than the predetermined tension.

22. The method of claim 21, wherein the motor vehicle includes an air bag system, and further includes the step of disabling deployment of the air bag system upon determining the presence of the child restraint seat.

23. The method of claim 22, wherein the predetermined tension is further defined as the tension that is normally not tolerable for human occupants and that which is normally exerted to secure a child restraint seat in place.

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24. The method of claim 23, wherein the sensing step further includes the step of providing a sensor disposed on the seat belt having a strain gauge to sense tension forces exerted on the seat belt.